What is claimed is:

1. An interconnect system comprising:

a first circuit unit containing a first modulator capable of modulating a first optical signal output from the first chip; and

a second circuit unit containing a first detector capable of detecting modulation of the optical signal to extract a first information stream.

2. The system of claim 1, wherein:

the second circuit unit further comprises a second modulator capable of modulating a second optical signal; and

the first circuit unit further comprises a second detector capable of detecting modulation of the second optical to extract a second information stream.

3. The system of claim 1, wherein the first circuit unit further comprises:

a photonic bandgap crystal; and

a line defect in the photonic bandgap crystal, wherein

the first modulator comprises a point defect within the photonic bandgap crystal and an electrode adjacent to the defect, wherein the point defect acts as a resonator for a wavelength of the first optical signal and has an optical property that varies with a voltage applied to the electrode.

4. The system of claim 1, wherein the first detector comprises a photodiode at a defect within a photonic bandgap crystal, wherein the defect acts as a resonator for a wavelength of the first optical signal.

5. The interconnect system of claim 1, wherein the first circuit unit is integrated on a first chip and the second circuit unit is integrated on a second chip.

6. The interconnect system of claim 5, further comprising a first light source that is external to the first chip and provides the first optical signal to the first circuit unit.

7. A system comprising:

a first device containing a plurality of locations that are separately accessible and a plurality of optical decoders respectively associated with the locations;

a second device that generates a logical address identifying a selected one of the locations in the first device;

a converter capable of activating each of a plurality of components of an optical signal, wherein the components respectively correspond to the locations, and in response to the logical address from the second device, the converter activates one of the frequency components that corresponds to the location that the logical address identifies; and

an optical path from the converter to each of the locations.

8. The system of claim 7, wherein each of the location is a storage location for data.

9. The system of claim 8, wherein the first device comprises memory.

10. The system of claim 9, wherein the first device comprises molecular memory.

11. The system of claim 8, wherein the first device comprises logic.

12. The system of claim 11, wherein the first device comprises molecular logic.

13. The system of claim 8, wherein the first device comprises a sensor.

14. The system of claim 13, wherein the first device comprises molecular sensors.

15. The system of claim 7, wherein the second device comprises a processor.

16. The system of claim 7, wherein the converter activates the frequency component that corresponds to the location that the logical address identifies by modulating the frequency component to encode data.

17. An interface for input/output from an integrated circuit, comprising:

a photonic bandgap crystal;

a line defect in the photonic bandgap crystal;

a point defect within the photonic bandgap crystal; and

an electrical element adjacent the defect.

18. The interface of claim 17, wherein the electrical element comprises an electrode adjacent to the point defect, wherein the point defect acts as a resonator for a wavelength of an optical signal and has an optical property that varies with a voltage applied to the electrode.

19. The interface of claim 17, wherein the electrical element comprises a photodiode within the defect.

20. A modulator comprising:

a photonic bandgap crystal containing a point defect, wherein a material in the point defect has a refractive index that depends on an electric field in the material; and

a first electrode and a second electrode that are separated from each other and on the same side of the point defect.

21. The modulator of claim 20, wherein the point defect acts as a resonator for a wavelength of a light signal to be modulated.

22. The modulator of claim 20, wherein the material in the point defect is lithium niobate.

23. A device comprising:

a waveguide for an optical signal;

a plurality of drop filters positioned to respectively extract a plurality of frequency components from an optical signal in the waveguide; and

a plurality of mosaics, each mosaic containing one or more tiles and an interface coupled to a corresponding one of the drop filters, wherein the interface directs an information signal base on the frequency component that the corresponding drop filter extracts from the waveguide.

24. The device of claim 23, further comprising a detector that generates an electrical

signal indicating a modulation of the frequency component that the corresponding drop filter extracts from the waveguide.

24. The device of claim 23, wherein each tile comprises memory.

25. The device of claim 23, wherein each tile comprises moletronic memory.

26. The device of claim 23, wherein each tile comprises logic.

27. The device of claim 23, wherein each tile comprises molecular logic.

28. The device of claim 23, wherein each tile comprises a sensor.

29. The device of claim 23, wherein each tile comprises a molecular sensor.

30. The device of claim 23, wherein each tile comprises a device for embodying quantum information.

31. The device of claim 30, wherein the quantum information is selected from a group consisting of a qubit, a qudit, and a qunit.

32. The device of claim 30, wherein each tile comprises a quantum dot.

33. The device of claim 30, wherein the information signal comprises the frequency component that the corresponding drop filter extracts from the waveguide.

34. A device comprising:

a moletronic circuit;

a photonic bandgap crystal;

a detector at a first defect in the photonic bandgap crystal, wherein the detector coverts an input optical signal into an input signal for the moletronic circuit; and

a modulator a second defect in the photonic bandgap, wherein the modulator is coupled to the moletronic circuit and modulates an output optical signal.

35. The device of claim 34, wherein the device has a size that permits the device to float in air.

36. The device of claim 34, wherein the moletronic circuit comprises a chemical sensor.

37. A method for transferring information between a first chip and a second chip comprising:

modulating an optical signal in the first chip;

transmitting the optical signal from the first chip to the second chip;

decoding modulation of the optical signal in the second chip.

38. The method of claim 37, further comprising:

selecting as the optical signal a selected frequency channel, the selected frequency channel been one of a plurality of frequency channels that respectively correspond to locations in the second chip; and

transmitting the optical signal to all of the locations in the second chip, wherein a detector associated with the location corresponding to the selected frequency channel decodes the modulation.